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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • SEPT. 27, 1947



Curium

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A SCIENCE SERVICE PUBLICATION

CHEMISTRY-MEDICINE

Hormones Synthesized

Most potent "essence of femininity" made artificially and cheaply to provide relief for women in middle age.

► THE MOST potent chemical "essence of femininity" ever concocted has been made artificially from simple, cheap chemicals, the American Chemical Society was told by Dr. Carl Miescher of the Swiss Ciba Company. This chemical, which is a female sex hormone effective in very small amounts, provides "relief for women undergoing the difficult transition associated with middle age."

The newly available "love chemical" is called a doisyonic acid in honor of Dr. A. E. Doisy of St. Louis University School of Medicine who in 1933 first pointed out its estrogenic or sex-promoting activity. A German process was

used to manufacture the particular compound bis-dehydrodoisyonic acid, which can be taken by mouth and does not have undesirable effects when administered medically.

This valuable drug is available in practically unlimited quantities in Europe, where it is being widely used, Dr. Miescher reported.

Another synthetic sex hormone, one that helps prevent miscarriages, was reported by Dr. Maximilian Ehrenstein of the University of Pennsylvania School of Medicine. The new drug, anhydrohydroxyprogesterone, can be given by mouth, whereas the synthetic version of the natural hormone must be injected.

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MEDICINE

New Triumphs Against TB

Physicians report enthusiastically on successes with streptomycin in treating various complications of the disease.

► NEW TRIUMPHS of streptomycin over tuberculosis and its complications are enthusiastically reported by investigators in different parts of the country.

A Chicago physician, Benjamin L. Brock, cites the healing action of streptomycin on 60 draining sinuses attacked by tuberculosis germs in 12 patients treated in the Veterans Administration Hospital at Oteen, N. C., of which he was formerly clinical director.

All but two of the patients had draining sinuses which originated in bone. The sinuses existed on the average about 24 months before treatment was begun. Laboratory tests proved that they were of tuberculosis origin.

Half the patients received treatment for 90 days and the other half for 150 days by injection of the drug into the muscles. The abscesses were allowed to drain, to facilitate healing.

The results were impressive, declares Dr. Brock, (*Journal American Medical Association*, Sept. 20). Eleven of the 12 patients showed outstanding clinical signs of improvement, displaying a

sense of well-being, an increase in appetite and a gain in weight. Nine of the 60 sinuses closed within one to four weeks and nine closed within six to eight weeks after the administration of the antibiotic was begun. It required between 10 and 12 weeks for 30 of the sinuses to close, and 11 closed within 13 to 20 weeks after beginning of treatment. Only one of the 60 original tuberculous sinuses continues to drain, but even this one has shown improvement.

Another complication, tuberculous meningitis with widespread tuberculous bacilli throughout the body, which has usually been fatal in the past, was completely arrested following treatment with streptomycin, according to Drs. Emanuel Appelbaum and Cyrille Halkin of New York.

Approximately nine months after the beginning of illness the patient was free of symptoms and appeared normal physically and mentally without the involvement of the nervous system which has usually followed streptomycin treatment of this disease.

The doctors, who are from the Bureau of Laboratories, New York City Health Department and the Willard Parker Hospital, ascribe the good results to the fact that treatment was begun early in the disease and the sensitivity of the organism to the drug.

In another patient treated with streptomycin for meningitis complicated by tuberculosis at the Oakland County Tuberculosis Sanatorium, Pontiac, Mich., the progress of the disease was halted after 175 days of drug injections. Drs. C. P. Mehas and Wayne E. Truax declare that the favorable results were due to early diagnosis and treatment. However, the patient did display a slight hearing loss.

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MEDICINE

Unightly Polio Shoes Destined for Scrap Pile

► THE UNSIGHTLY cork or wooden high sole on the shoe of an infantile paralysis cripple is destined for the scrap pile. The reason is that orthopedic surgeons are finding more and better ways of giving the polio victim legs of equal length after the disease has shortened one of them.

Eventually the time may come when no child will need to face adult life with the handicap of the high-soled shoe, Dr. Joseph Barr of Boston declared at the Georgia Warm Springs polio treatment center's twentieth anniversary.

Exactly how many polio victims are left with one leg shorter than the other is not known. About one-third of the patients treated at the Massachusetts General Hospital's outpatient department who got the disease before the age of 16 developed marked inequality in leg length, Dr. Barr said.

The greatest shortening occurs in young patients with one normal and one severely paralyzed leg.

In grown-ups, the surgeon can equalize the legs either by lengthening the short one or shortening the long one. Shortening the long leg seems to be the preferred method, Dr. Barr said.

In the growing child equal leg length may be achieved in many cases by arresting the final development of the ends of the bone. This normally takes place at the end of the growing period and stops further growth.

Cutting certain nerves from the spine to the legs is another method sometimes used to equalize leg length. Its value is still a matter of debate among surgeons.

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CHEMISTRY

Curium Is Isolated

Number 96 in the atomic table, curium is the heaviest and most violently radioactive of the chemical elements and therefore the most dangerous to handle.

See Front Cover

► THE human eye has seen for the first time the heaviest and most violently radioactive of the chemical elements, curium, number 96 in the atomic table.

Isolation of curium was announced by Dr. Isadore Perlman, of the University of California, to the American Chemical Society meeting in New York.

The world's total supply, barely visible to the unaided eye, is a speck of a whitish-yellowish hydroxide that bubbles and glows softly with radioactivity.

The picture of curium on this week's cover was photographed in a dark room by the visible light given off by the curium itself. The specimen is contained in a small hollow glass needle, in the upper part of which a few drops of the glowing curium are clinging. The black shadow at the bottom is the needle's solid tip.

It transmutes itself at the rate of one-

half per cent a day into the atom-bomb element, plutonium. It is the most dangerous of all the elements to handle.

Chemists hailed its isolation by L. B. Werner as one of chemistry's most difficult separations because curium is so like americium, element 95, from which it was made by intense neutron bombardment in the atomic pile.

Not content with creating elements unknown in nature and converting matter into atomic energy, scientists are planning to make high-voltage machines of such power that energy can be converted into matter.

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CHEMISTRY

Chemists Not Agreed On Name for Element 61

► CHEMISTS had a hot controversy on their hands over the naming of element 61, the only one of the 96 on

which there has not been general agreement.

The name "prometheum" was proposed at the meeting of the American Chemical Society by Drs. J. A. Marinsky and L. E. Glendenin, once at Oak Ridge and now at MIT, chemists who discovered relatively large quantities of two isotopes of this element in the fission products of uranium as produced in the atomic bomb.

The name is based on that of the god who according to mythology is the one who brought fire to the earth. Other prior claims of discovery have suggested illinium, florentium and cyclonium as names for element 61.

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CHEMISTRY

Lignin Synthesis Aids Understanding

► LIGNIN, the puzzling compound that makes up about half of wood and most of chemical wood waste, has been made synthetically in the Northern Regional Research Laboratory, U.S. Department of Agriculture, Peoria, Ill., the American Chemical Society meeting in New York was told by Dr. Alfred Russell.

Not that there is such a need for lignin that its synthetic production is called for; on the contrary, there is an embarrassing surplus of it at present. But the chemical makeup of lignin has never been at all clearly known, and a synthesis of what appears to be an identical compound will aid in a chemical understanding of the natural substance, and perhaps to an earlier discovery of practical uses for it.

There is more than one kind of lignin, and the kind that Dr. Russell has duplicated in the laboratory is found in the wood of pines, spruces and related trees. He made it by a rearrangement of the molecules of an already known compound, vanillin monoacetate.

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ZOOLOGY

Coconut Crabs from Bikini Brought to National Zoo

► THREE coconut-stealing land crabs from Bikini have just been placed on exhibit at the National Zoological Park in Washington. They were collected on one of the islands of the famous atoll by F. M. Bayer of the U. S. National Museum.

They are handsome brown crustaceans, with bluish highlights. The largest has a shell about a foot across. In addition to



BIKINI CRABS—This boy is looking through a glass at three coconut-stealing crabs from Bikini which have just been placed on exhibit at the National Zoological Park in Washington.

ripe coconuts, they will eat any oily fruit such as avocado, as well as meat and fish. And big land crabs will eat little land crabs if they get a chance.

These land crabs are great nuisances wherever coconuts are grown commercially. They climb up the trees and cut

off the nuts, then climb down again to open and eat them. In Tahiti their name is *ua vahi haari*, which means the crab that breaks coconuts. To zoologists they are *Birgus latro*—*latro* being Latin for thief.

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CHEMISTRY

"Solid" Gasoline Desired

French chemist working for U. S. Army seeks solid of varying hardness that will burn but will not explode. Still question whether envelope or solid achieved.

► SOLID chunks of gasoline are being developed by a French chemist working for the U.S. Army.

First leak in the secrecy surrounding solidified gasoline came in a French English-language news sheet issued in New York. The publication said that the chemist, Pathus-Labour, had made an "envelope" which permitted gasoline to be handled like a solid and without danger of fire.

An Army spokesman has disclosed that M. Pathus-Labour is now in the United States at the U.S. National Bureau of Standards developing his discovery under contract to the Office of the Quartermaster General of the Army.

The new process is not an envelope or packaging process but solid gasoline itself, Army sources insist. Solid gasoline, they explain, can be made in varying degrees of hardness. Some chunks of gasoline are a spongy, soft solid.

Solid gasoline will burn but not explode, it was reported.

Either solid gasoline or the packaging process can mean safer, more efficient handling of gasoline. A filling station attendant of the future may take a tankful of fuel off his shelf and hand it to you, if the process is practical for general use.

Drums, cans, tank cars and trucks and modern steamship tankers might give way to standard, less specialized means of storage and transportation with solid gasoline.

Details of the Frenchman's solid gasoline process are cloaked in official secrecy, as the project is termed "highly classified."

French report of M. Pathus-Labour's work was made in this country in "Courrier de France," a weekly news sheet, issued under the letterhead of the Information Service of the French Embassy.

The French description said that the chemist had produced a new product related to cellulose and called "carburolithe." Carburolithe is termed a non-inflammable film for covering gasoline so that the liquid fuel can be handled as a solid.

Gasoline, wrapped in this film, can be put into a fuel tank without any change in the tank other than a device for ripping open the covering, according to the French source. Carburolithe changes directly into a gas from the solid state so that there is no residue in the tank. Cost of the coating material is said to be less than \$2 per ton.

The French said that the U.S. was carrying on investigation of the gasoline process, because "the French government does not wish to engage in expensive research at this time." The U.S. Army will get a non-exclusive permit to use the process in return for aiding the French chemist, it was indicated.

The French story of Pathus-Labour's work differs sharply from the U.S. Army version. Here, the process is declared to be one for making solid gasoline. Either development could revolutionize the storage and transportation of gasoline.

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ZOOLOGY

Toads, Free of Cancer, May Be Guarded by Venom

► DOES the toad's venom guard it against cancer as well as natural enemies?

This question has been raised, but not answered, by researches of Dr. Joseph Skapier of New York.

He examined 25,000 European toads, collected on the outskirts of Paris, and 25,000 North African toads from Algiers. Not one of the toads had cancer. These are the only animal species free from cancer at present known.

Dr. Skapier and his colleagues tried to produce cancer in 100 toads of mixed variety by putting powerful, cancer-producing chemicals on their skins. These failed to cause cancer, but the toads all died within 15 to 25 days after the beginning of this experiment. Death resulted from the poisonous effect of the chemicals.

"The role of the toad's venom in the 'immunity' against spontaneous or induced carcinoma cancer is being considered for investigation," Dr. Skapier said.

Various attempts to produce cancer experimentally in most cold-blooded vertebrate animals, he also pointed out, have failed.

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CHEMISTRY

Slow Action Insulin Made

Diabetics need only one injection per day of this new insulin which has been combined with part of the blood's red color chemical, hemin.

► A NEW slow action insulin for diabetes has been made by combining regular insulin with part of the blood's red color chemical. Method of preparing it was reported by Drs. Richard G. Roberts, Doris M. Hilker and Adrian Gasior-Russell of the Chicago Medical School at the meeting of the American Chemical Society in New York.

Diabetes will only need one injection per day of this new insulin, instead of the two to four often required when plain insulin is used, the Chicago chemists predicted on the basis of tests with rabbits.

The blood chemical used to prolong insulin's action is hemin. It is part of the hemoglobin which gives blood its red color and carries oxygen throughout the body. The fact that it comes from blood and is therefore not foreign to the body is said to give it an advantage over protamine, another chemical which has been combined with insulin to prolong its action.

Besides hemin from blood, the new insulin compound contains choline. This chemical, sometimes called a vitamin and sometimes a hormone, plays a role in the body's utilization of fat. Insulin controls sugar utilization. Choline, when given to diabetic patients with fatty livers, permits lowering of their insulin dosage, according to the report to the chemical society.

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BIOLOGY

Life-Form Samples Sealed For Two-Century Siege

► SOME time in the year A.D. 2147 a group of biologists, whose great-grandfathers haven't even been born yet, will gather on the Notre Dame campus to lift a dusty copper box out of a hollow stone block. Cutting it open, they will find a collection of living organisms, viruses, vitamins, etc., in sealed glass tubes, all carefully labelled with India ink on linen.

The opening of these tubes will be the conclusion of a long-range experiment to be started when Prof. James A. Reyniers, director of Notre Dame's laboratories of bacteriology, placed this carefully selected and prepared collection of representative life forms in the cornerstone of the University's new Laboratory for Germ-Free Life just before its formal laying by the Most Rev. Lawrence L. Graner, C.S.C., D.D., bishop of Dacca, India.

New buildings at the University of Notre Dame are planned to last at least a century, and possibly two centuries. The bacteria, viruses, protozoa, fungi, insects and other lower life forms sealed into the cornerstone will have a good chance to demonstrate their longevity. Samples of penicillin, streptomycin, amino acids and vitamins can show whether or not they retain their properties for 10 or 20 decades.

Sealed in, also, will be specimens representing the present laboratories' unique activities: samples of tissues from animals born and reared with no germs in their bodies, together with microfilm copies of books and articles telling how they were reared, and film and wire recordings of the voices of the scientists now at work here.

Finally, as representing the physical environs of the University of the present time, there will be sealed-in samples of sand, clay and fertile loam from the neighborhood, as well as tubes of recent rainwater and of water from Notre Dame's lake. All these have populations of microscopic life forms. It will be interesting to the biologists seven human generations hence to compare the survivors, if any, with the forms living in the same places then.

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PHYSICS

Cosmic Rays Being Counted In Subway Station

► COSMIC RAYS, which have been counted in V-2 rockets at an altitude of more than 100 miles and deep in the earth in mines, are getting a new check-up underground, two English scientists have disclosed. (*Nature*, Sept. 6.)

The mysterious particles from outer space are being counted by E. P. George and A. C. Jason of Birkbeck College, University of London, in a unique laboratory under London. The scientists have their counting equipment set up in the Holborn subway station.

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SCIENCE FOR FUTURE—Samples of many life-forms sealed in cornerstone of the new research building at Notre Dame.

ENGINEERING

Synthetic Crystals in Use

Replace natural quartz in telephone circuits. Are made from tiny "seeds" in a solution of ethylene diamine tartrate.

► MAN-MADE crystals to replace the natural quartz widely used in telephone circuits are already in successful use, the Bell Telephone Laboratories revealed. They will replace some 90% of the quartz used in long-distance telephone systems, it is expected.

Quartz crystals, or an equally good substitute, are essentials in radio transmission and long-distance telephony. They are able to convert mechanical energy, such as sound waves, into electrical energy, or they can reverse the process. Scientists say they have piezoelectric properties. Many other materials have the same property but in the past quartz has been the most practical to use because of reliability and moderate cost.

During the war, quartz crystals for electrical work stood high on the list of essentials in short supply. One great use of the crystals is in radio, where they are employed in transmission sets to regulate the frequency of outgoing waves. Little quartz suitable for electrical applications is found in the United States; most is imported from Brazil, and the war drain has made that source short.

In long-distance telephony, crystals which will vibrate with unvarying frequency when electric currents are applied to them are used in sending many conversations over the same wires at the same time. These conversations create electrical waves of different frequencies; the crystals guide each conversation into its proper channel.

Chemically, the new crystals are markedly different from quartz. They are ethylene diamine tartrate, EDT for short. They are "grown" from tiny "seeds" in a solution of the chemical. The seeds are made from the same chemical by evaporation. The large crystals formed finally weigh about a pound and are about six inches in length and two by three inches in cross-section.

These full-grown crystals are cut into plates, roughly an eighth of an inch thick and about one inch long. They are then coated with an extremely thin film of gold, which serves as an electrical connection. They are then mounted in a glass envelope to form the completed crystal unit.

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CHEMISTRY

New Uses For Sand Found

Important perfumes, flavors and dyes made chemically from silicon, basic element of common sand. Distance between molecules, forming ring, have been measured.

► NEW and important perfumes, flavors and dyes fashioned chemically out of silicon, the basic element of common sand, are possible through a new class of compounds reported by two Cornell University chemists to the American Chemical Society meeting in New York.

A preliminary exploration forecasts a series of silicon compounds that parallels in many respects the famous aromatic compounds of carbon responsible for most of the synthetic odors, tastes and colors around us in the modern world.

The Cornell scientists, Drs. E. H. Weller and S. H. Bauer, have made measurements upon a silicon ring in

many respects comparable to the benzene ring of carbon. Aromatic compounds are based upon the benzene ring structure in which six carbon atoms join hands to form a remarkably stable chemical group. Silicon atoms, similar to carbon in many ways, call upon the sister-element oxygen to help them form a similar ring.

This "siloxane" ring has the full name: hexamethylcyclotrisiloxane. So exactly has the ring been measured by Drs. Weller and Bauer that they know the distances between the molecules and the angles at which they are distributed with reference to each other in space.

Silicon and oxygen atoms join alternately to form a flat ring. Carbon and hydrogen atoms, which are the methyl part, make a sort of fence at right angles around the outside.

Whether the siloxane ring will form sweet-smelling compounds as the benzene ring does is not yet known, but the Cornell chemists say the chemical they measured is only the first of a long series analogous to the carbon polymers that are marvelous new fibers, textiles and plastics we now use every day.

Already silicon has mimicked carbon to form a whole family of silicon chain compounds—vapors that waterproof, liquids that lubricate and solids with remarkable properties. Now silicon promises to rival carbon in the making of ring compounds of great future promise.

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MEDICINE

Nitroglycerin Aids in Diagnosis of Migraine

► SUFFERERS from the recurrent agonizing headaches of the type known as migraine can have their ailment more accurately diagnosed if the attending physician will give them brief headaches of the same kind by administering a light dose of nitroglycerin, then quickly curing the purposely induced pain.

This suggestion is offered by two Toledo physicians, Dr. Max T. Schnitker and Dr. Maurice A. Schnitker (*Journal, American Medical Association*, Sept. 13). It is sometimes difficult to distinguish between migraine and the type of headache known as histamine cephalgia, they point out.

Migraine pain is caused by the over-expansion of the external carotid artery, principal carrier of blood to the head. A very small dose of nitroglycerin can reproduce this swelling and thus bring on the headache. If the patient's ailment is histamine cephalgia, nitroglycerin will not reproduce it, though a light dose of histamine will.

Purposely induced migraine attacks can usually be stopped by simple pressure on the carotid artery. If this does not work, breathing 100% oxygen for five minutes, or the administration of from one-half to one milligram of ergotamine tartrate, will stop the pain. The condition is permanently corrected with calcium lactate medication, or with phenobarbital or by the elimination of the allergens that are sometimes found to be responsible.

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NUTRITION

Vitamin Increase Studied

Sweet potatoes' content of B-1 is found to increase 25% when cooked. New nutritional factor "X" discovered in milk.

➤ **HEATING** vegetables is commonly supposed to cut their vitamin content—so much so that the eating of salads and other forms of raw vegetables has become a modern cult. Yet at least one vegetable has at least one of its vitamins actually increased by moderate heating. E. F. Kohman and A. A. Rugola of the Campbell Soup Company told the meeting of the American Chemical Society in New York. Sweet potatoes' content of thiamin, or vitamin B-1, was increased 25% when the roots were gently heated to a temperature just below the boiling point.

Sugar content in sweet potatoes increases after harvesting, and goes up again when they are cooked, the two chemists declared. This latter sugar increase is due to the action upon their starch of certain enzymes that are effective at temperatures high enough to destroy most enzymes.

Disease Reacts to Vitamin

Children suffering from the rare but highly fatal disease known as cystic fibrosis of the pancreas may have their lives saved by a predigested form of vitamin A, Dr. A. B. McCoord and associates of the University of Rochester told the meeting. Young sufferers from this pancreatic ailment are unable to absorb vitamin A in their food. A predigested alcohol form of the vitamin, however, is readily taken up.

"X" Nutrient Aid to Health

"X," an unknown vitamin or other nutritional factor in milk and its non-fatty products, was introduced to the chemists by A. M. Hartman and C. A. Cary of the U. S. Department of Agriculture. "X" is present not only in milk but in skim milk, in commercial skim-milk powders, and in cheeses of the Swiss, Cheddar and cottage types; also in lean pork and veal and in green leaves. It does not occur in any kind of flour, cornmeal, soybean or cottonseed oil meals, or in yeast or egg white. It is found in high concentration in liver

extracts used in the treatment of pernicious anemia.

Young rats nursed by mothers kept on "minus-X" diets fail to grow normally and as a rule eventually die. Ill effects of the lack are quickly offset by adding "X" in supplementary rations. Although "X" has not yet been identified, concentrated preparations have been made that are highly potent in offsetting its lack in experimental diets.

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RADIO

Fifteen-Pound Radar Warns Pilot of Mountains

➤ **ALL PLANES** of the Trans-World Airline (TWA) are now being equipped with the new Howard Hughes radar anti-collision device. This apparatus can be set to give automatic warning of mountains or earth either 2,000 or 500 feet ahead or below.

This radar transmitter-receiver set is in a box unit nine by eight by 15 inches in size which weighs, together with

antenna, cable lengths and instrument panel warning lights, approximately 15 pounds. Its power is obtained from the plane's battery at 28 volts.

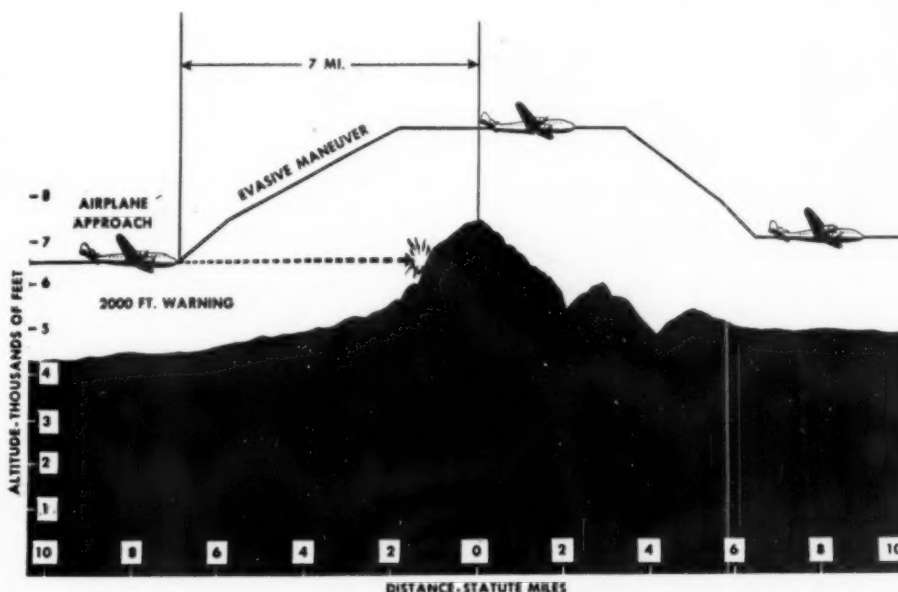
The radar antenna used is a single V-shaped pole mounted on the belly of the plane just behind the leading edge of the wing. It gives coverage of the entire hemisphere below the ship, including straight ahead. It does not give coverage for the space above. The radar set has no adjustments to be made during flight except a single switch to select the 2,000 or the 500-foot operating range.

When approaching a high mountain peak, the first warning received by the pilot will usually not be radar echoes from the peak itself but those from the foothills below. These are on most mountain approaches, and may extend from a few to 30 miles from the mountain itself. The warning gives the pilot plenty of time to climb to a safe altitude.

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America has *cows* that produce 55 quarts of milk a day, although the average is only nine quarts; it has *hens* that lay an egg nearly every day of the year, more than twice the average.

Lacquer trees, from which lac is obtained to make the widely used finish, are male or female; only female trees produce seed, the lac is obtained from the male.



ANTI-COLLISION DEVICE—The radar antenna is mounted on the belly of the plane and warns the pilot of terrain 500 to 2,000 feet ahead or below. All TWA planes are now being equipped with this device.

MEDICINE

Sulfa Cures Meningitis When Other Remedies Fail

► SULFA drug cures of meningitis in cases in which penicillin and streptomycin failed were reported by Drs. A. A. LaLonde and W. James Gardner of Cleveland at the meeting of the American College of Surgeons in New York.

The sulfa drug was made more efficient, or potentiated as the scientists phrased it, by giving with it another chemical, urea.

One of their patients was a 31-year-old man who had a bad skull fracture. Penicillin and sulfadiazine were given in the hope of warding off the meningitis which the doctors feared would occur. But meningitis developed while the patient was getting these two drugs. Streptomycin was then given by injection into the spinal canal, but this had to be stopped because it gave him excruciating leg pain. Sulfadiazine was then given with urea and the patient got well.

Penicillin and streptomycin have gotten so much attention, the doctors pointed out, that the good results which can be obtained with sulfa drugs and urea have been overlooked. They think this combination of drugs should be used more often.

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ASTRONOMY - METEOROLOGY

Starlight During Day Measured to Predict Rain

► ASTRONOMERS measuring the brightness of stars in broad daylight with new sensitive instruments may help future weather forecasters tell you when it will rain.

Daytime measurements of the light from stars were described to the American Astronomical Society, meeting in Evanston, Ill., by Dr. John Hall, Amherst College astronomer. Dr. Hall reported that he had used photo-electric cells with both a photomultiplier tube and an infra-red-sensitive lead sulfide cell to make the difficult light measurements.

In addition to giving astronomers more starlight data, the daytime measurements will help meteorologists study how much potential rainwater is in the air overhead.

U. S. Weather Bureau scientists in Washington said that the new techniques may give a new, 24-hour system of keeping track of the water vapor in the air. A new water-vapor spectroscopy nearing

completion at the Weather Bureau will be used only during sunlight hours. Starlight can now reveal the sky's secrets around the clock, both day and night, with Dr. Hall's equipment.

He separates light of the stars from the total light from the sky, even when the sun is shining, by varying the starlight at a fixed frequency while the other light is kept constant. The photomultiplier tube which can be used with a photoelectric cell to separate the starlight is produced by the Radio Corporation of America, while the lead sulfide cell which is sensitive to infra-red light was at the heart of the wartime snooperscope and other infra-red devices.

Possible uses which astronomers may make of the new starlight measurements include measuring the magnitude of faint stars in bright moonlight and observing the daylight paths of stars across the heavens.

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ENGINEERING

Roof-Top Roads Planned To Relieve City Traffic

► BRITAIN will have roof-top roadways for city through-traffic if proposals to the British Association for the Advancement of Science are put into effect.

The road would rest on the tops of 100-foot-high business buildings with cross streets bridged. Access spurs would be provided every mile or so.

English cities, like many in other parts of the world, have traffic problems growing more difficult year by year. One solution might be underground roads, another elevated routes, above present streets, supported by heavy steel trestlework. Both are expensive. Utilizing the same steel framework to support both the building structure and the roadway on the roof would be far less costly, it was claimed.

Roof-top roads would have other advantages, it is argued by their proponent, Wing Commander T. R. Cave-Browne-Cave. They would in no way interfere with present underground structures such as subways, water lines, gas pipes, sewage and drainage conduits, or with electric cables for telephone, telegraph, lighting and power. They would leave streets free of the cumbersome structures necessary to carry elevated roads, and property damage to abutting business houses would be eliminated.

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IN SCIENCE

INVENTION

Sewing Machine Operates On Different Principle

► A CHAIN-STITCH sewing machine that operates on a new principle is covered by U.S. patent 2,426,636, just granted to the late Thomas E. Monroe of New York, represented by his executor, William R. Donaldson. It uses two threads in sewing its seam, with both spools placed on spindles at diverging angles under the fabric table, about where the bobbin operates in a lock-stitch machine.

The needle has no eye and is never threaded. Instead, it is a pointed hook, that picks up first one thread, then the other, as they are shifted back and forth on an oscillating carrier with each stitch, thus drawing each through the loop just formed by its companion and making a continuous, well-locked chain.

The arm of the machine is not horizontal but slopes upward from the base at about a 45-degree angle. Within it is housed the small motor that supplies the operating power.

Science News Letter, September 27, 1947

MEDICINE

New Grants for Teaching And Research in Medicine

► NEW encouragement for beginning teachers and researchers in medical science is offered in grants announced by the John and Mary R. Markle Foundation in New York.

The grants, offering financial assistance for a period up to five years, are designed to fill a gap in scholarships and grants between the student and the successful scientist. A survey by the foundation showed that student scholarships and grants to famous scientists who have made names are available but there is little aid for the scientist starting a career in academic medicine.

Grants will be made under the new program to "scholars in medicine," young scientists who are qualified for medical faculties and for conducting research. The scholars-in-medicine program will begin in the 1948-49 school year. Each grant to a school will be for \$25,000 for five years, with an estimated 50 scholars to be aided by \$1,250,000 in five years.

Science News Letter, September 27, 1947

CE FIELDS

PHOTOGRAPHY

New Machine Reproduces Drawings at Mimeo Speed

► PHOTO-REPRODUCTIONS of text or drawings at mimeograph speed are the revolutionary promise of a new duplicating method on which U. S. patent 2,427,443 has just been issued in Washington to Theodore R. Cochran of Glen Ellyn, Ill.

Key to the method is the peculiar photosensitivity of a series of organic compounds of tungsten, molybdenum and related metals. Irradiated with light just on the borderline between high violet and near ultraviolet, these compounds turn dark without further treatment of any kind; yet they are inert to ordinary daylight and lamplight.

In a preferred form of his duplicator, a transparent or translucent negative or master copy is secured to the rotating drum of a mimeograph-like machine. At the bottom of the turn, it passes under a bar-lens, behind which is a tubular mercury-vapor lamp. An automatic paper feed passes under it, on each turn, a sheet of paper coated or impregnated with the photosensitive metal salt. The image appears at once, and is permanent.

Rights in the patent are assigned to the A. B. Dick Company, pioneer manufacturers of mimeograph equipment.

Science News Letter, September 27, 1947

PHYSICS

Radar May Detect Cosmic Ray Bursts

► RADAR may have a new job helping unlock secrets of the universe hidden in the mysterious cosmic rays which bombard our atmosphere from outer space.

British scientists are launching experiments using sensitive radar in an effort to detect electrical bursts from very energetic cosmic rays. The experiments were revealed to the British Association for the Advancement of Science by Sir Edward Appleton, secretary of the British Department of Scientific and Industrial Research.

First efforts to track cosmic rays with radar will be made at the University of Manchester, under Dr. A. C. B.

Lovell, who recently reported the discovery with radar of a daytime meteor shower. The new attack on cosmic rays is planned as an extension of the meteor discoveries with radar.

Bursts of electrically charged particles, called ions, in the earth's atmosphere are caused by some of the powerful cosmic rays from outer space. The English scientists hope to be able to spot radio reflections from these bursts with their radar equipment. More sensitive radar equipment than was used to detect the daylight meteor showers will be used in the cosmic ray experiments.

Dr. Lovell told the British Association meeting that the three-month shower of meteors which was discovered with radar was unique in both intensity and duration compared with "shooting star" displays which have been seen with human eyes.

The showers came during daylight when both visual observation and photographic methods would not have found the meteors. But radio echoes bounced off the objects and were detected. This method may give scientists a new tool for studying cosmic rays.

Science News Letter, September 27, 1947

MATHEMATICS

Figure Center of West Established at Los Angeles

► HOLLYWOOD is famous for its figures, but the figure center of the West is going to be established at the University of California at Los Angeles.

The new figure center is not going to deal with the curve-lined figures of Hollywood, though. The figures will be mathematical, and the National Bureau of Standards' new Institute of Numerical Analysis will feature high-speed electronic calculators instead of high-powered press agents.

A giant electronic computing machine under development at the Bureau of Standards in Washington will be installed at the Institute to solve in minutes problems which now require days of computing.

The new Institute will do both research on electronic computers and actual computations for industries, research institutions and government agencies in the West. An announcement from the Bureau of Standards in Washington reported that the site was chosen because of the concentration of aircraft industries and presence of several major scientific institutions in that area.

Science News Letter, September 27, 1947

CHEMISTRY

Orange Dye Produced by Mold from Potato Family

► AN ORANGE dye that may find industrial use has been found in a fungus that causes a disease in plants of the potato family, *Fusarium solani*, by Prof. F. F. Nord, S. Weiss and J. V. Fiore of Fordham University. The pigment is purple as it occurs in the mold and the crude extract, but when purified and made slightly acid it turns orange. It has been given the name *Fusarium solani* D₂, they reported before the American Chemical Society in New York.

The pigment also seems to have antibiotic, or penicillin-like, properties for it has been found able to inhibit the growth of another, related fungus, *Fusarium lini*, which is the cause of the extremely destructive plant disease known as flax wilt.

Science News Letter, September 27, 1947

CHEMISTRY

Concentrated-Acid Process Changes Cellulose to Sugar

► SUGAR can be made from cottonseed hulls, peanut shells, ground cornstalks, wood flour and other cellulosic materials by a new and more economical acid-conversion process on which U.S. patent 2,426,677 has just been granted to Prof. Ellis I. Fulmer of Iowa State College, Ames, Iowa; Dr. John W. Dunning of Abilene, Texas, and Ralph H. Fash of Fort Worth, Texas.

One difficulty in some previous acid-conversion processes was that the re-concentration of acids diluted in changing cellulose into sugar cost so much that it ate up all possible profits. The new process gets around that difficulty by using exactly measured quantities of concentrated acid (preferably sulfuric) and mixing it so intimately with the finely-ground cellulose under pressure that there is no need for an acid-reclaiming stage at the end.

The cellulosic raw material must be as nearly water-free as practicable at the outset, the inventors warn, in order to prevent the heat of mixing water with concentrated acid from changing the higher sugars to glucose or other monosaccharides, which are less valuable. Supplementary water-cooling during the subsequent digestion of the acidified pulp, after dilution with water, may be desirable.

Rights in the patent have been assigned to Anderson, Clayton and Company, of Houston, Texas.

Science News Letter, September 27, 1947

ASTRONOMY

Water Animals in Sky

Whale and three fish appearing in southern evening sky. Pegasus also visible. October nights are not favorable for seeing planets.

By JAMES STOKLEY

►FOUR AQUATIC animals—a whale and three fish—are among the constellations now visible in the southern evening sky! Of course, one must not expect to see accurate pictures of these creatures on looking heavenwards this evening, for as readers of this series must now realize there is generally no resemblance between the figures the stars make in the sky and the objects after which the groups are named. But if we associate these areas of the sky with the names, and think of them as regions dedicated to the various objects, rather than as realistic pictures of them, it may be an aid in finding our way among the stars.

The two accompanying maps depict their arrangement, as viewed Oct. 1 at 10:00 p.m. (your own variety of standard time), an hour earlier in the middle of the month and two hours earlier at the end. There, high in the south, is indicated a square of stars—the “great square” which forms part of Pegasus, the winged horse. Just below the square are shown four stars which form one of the two fish in the constellation of Pisces. The line of stars running from these to the east to the point of a V was shown on the old star maps as a string tying the two fish together. The other is represented by the star at the upper left-hand part of the V.

Head of Whale to East

Directly below the V is the figure of Cetus, the whale, of which the head is to the east, while the body is the larger group at the western end of the stars so connected. Lower in the sky, directly south on the map, is Piscis Austrinus, the southern fish. In this shines the first magnitude star called Fomalhaut. Just above it is Aquarius, the water carrier, represented of old as a bearded man carrying a jar from which water flows to—of all places!—the mouth of the fish.

Next to Aquarius, to the west, is Capricornus, a rather faint constellation representing an animal half goat

and half fish, so here we have still more water represented. It is rather curious to find this part of the sky so wet. One reason that has been suggested is that in ancient times, when the constellations were named, the sun passed through this part of the sky in the rainy season.

For the brightest star visible these October evenings, look toward the west, for the constellation of Lyra, the lyre, in which the star Vega shines. Directly above it is Cygnus, the swan, some of the stars of which form a large cross, with first magnitude Deneb as the star at the top. A little farther south is Aquila, the eagle, marked by another brilliant orb—Altair.

Other Bright Stars

Two more stars of the first magnitude are seen in the northeast. One is Capella, of Auriga, the charioteer; the other is Aldebaran, of Taurus, the bull. Later tonight, and in the early evening during winter months, these groups will hang high overhead, while the lyre and its neighbors will then have passed out of sight below the horizon.

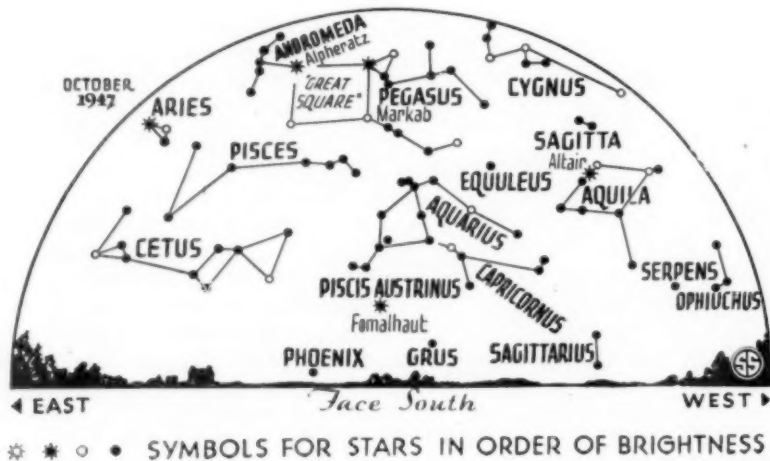
These October evenings are not favorable for seeing planets. Jupiter is low in the southwest at sunset, and sets an hour later. Soon after midnight the red planet Mars, now of the first magnitude, rises in the east, in Cancer, the crab. It is followed, in about an hour, by

Saturn, still brighter, in Leo, the lion. Mercury and Venus this month are so nearly in the direction of the sun that they are hidden in its glare.

October brings us to the beginning of the year's last quarter. In a few months 1948 will be here, and we will perform the annual rite of taking down the old calendar and putting up a new one, as we shall at the beginning of 1949 and again of 1950. But perhaps that will be the last time we will do it. If a bill that was proposed with support from both parties in the last session of Congress passes, 1950 will mark the inauguration of a new and permanent calendar, the so-called “World Calendar.” If it is adopted, every year and every quarter of the year, will start on a Sunday. Each quarter will have 91 days in it. The first month of each quarter (January, April, July and October) would have 31 days, and all the rest 30. The reason for starting in 1950 is that in that year our present calendar happens also to begin on Sunday, so the two would gear smoothly together. Not until 1956 will the two calendars again coincide at the start of the year.

Product of Evolution

Though our present calendar seems pretty well established by usage, it is a product of evolution. The Egyptian calendar, established in 4236 B. C., and based on a very accurate determination of the relation of the earth to the sun, had a year of 365 days, divided into three seasons, each of four months of





30 days. This left five days over, which were celebrated as feast days at the end of the year. Then came Julius Caesar who, with the help of the astronomer Sosigenes, obtained the value of $365\frac{1}{4}$ days for the length of the year. To take care of the fraction, he introduced the leap year, with an extra day every fourth year, when four quarters had accumulated. He arranged the months approximately as they are today.

The Egyptians had a week of ten days, and so did the Greeks, while the Romans had an eight-day week. Then the Emperor Constantine introduced the seven-day week, and it has come down to us from him.

Origin of Leap Year

The year is actually a little less than $365\frac{1}{4}$ day long, so by 1582 the Julian calendar had run ahead. Eventually this would have brought religious festivals in the wrong season. With the advice of the astronomer, Lilius, and the mathematician, Clavius, Pope Gregory XIII ordered a new calendar, to take effect in October, 1582. To bring it back into step, ten days were dropped completely, October 4 being followed by October 15. Then to keep it in step three leap years were dropped every four centuries. That is, every year divisible by four is a leap year, unless it marks the close of a century, like 1800 or 1900. Then it is a leap year only if divisible by 400. Thus, 1700, 1800 and 1900 were not leap years, but 2000 will be, like 1600. Non-Catholic countries did not follow this right away. England, for example, adopted it in 1572, when 11 days had to be dropped, which resulted in riots in the streets of London. This, the Gregorian calendar, is the one we still use.

In regard to leap years, the World Calendar follows the Gregorian rule. The chief difference is the introduction

of a kind of a day that we do not have at present, one which is not part of any week. If the year were exactly 364 days long, it would be very simple, for that would be exactly 52 weeks. However, it actually is 52 weeks, plus a day and slightly less than a quarter. So the World Calendar has, in ordinary years, its 52 weeks, ending on Saturday, Dec. 30. The next day is Dec. W, the year-end World Holiday, which might also mark the celebration of the new year. The next day thereafter is Sunday, Jan. 1. In leap years a similar extra day, June W, comes between Saturday, June 30, and Sunday, July 1.

Many religious organizations have expressed a favorable view toward the World Calendar, and it has been endorsed by a number of commercial groups, who see the great convenience of getting away from the wandering holidays, the varying quarters and other defects from which our calendar now suffers. Perhaps, in a few years, we will have another change of calendar, and this time it may be one that will remain for a long time to come.

Time Table for October

Oct.	EST.	
7	5:29 a. m.	Moon in last quarter
8	3:36 p. m.	Moon passes Mars
9	1:00 p. m.	Moon nearest; distance 229,- 100 miles
	4:48 p. m.	Moon passes Saturn
14	1:10 a. m.	New moon
16	1:01 a. m.	Algol (variable star in Perseus) at minimum
	11:41 p. m.	Moon passes Jupiter
18	9:50 p. m.	Algol at minimum
21	6:39 p. m.	Algol at minimum
	8:11 p. m.	Moon in first quarter
	10:00 p. m.	Moon farthest; distance 251,- 200 miles
24	3:27 p. m.	Algol at minimum
29	3:07 p. m.	Full moon

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, September 27, 1947

Benjamin Franklin, statesman and scientist, proposed a *universal* religion.

African *chameleons* have tongues longer than their bodies.

AERONAUTICS

Light Amphibian Plane Ideal for Sportsmen

➤ WITH a boat-shaped body and a retractable wheel landing gear, a new small plane of the Goodyear Aircraft Corporation can light on water or earth. The first of these amphibians is now undergoing exhaustive field and flight tests.

This three-place plane, called ideal for sportsmen, has two forward seats and one to the rear. It also has a baggage compartment of 11 cubic feet capacity. Powered by an 145-horsepower Franklin engine, it has a cruising speed of 110 miles an hour, and a range of about 370 miles. It is 26 feet in length and has a wingspan of 36 feet.

Pilot and passenger, well raised in the boat-shaped fuselage, have a clear view to the front and sides at all times. The wings are to the rear and placed high on the fuselage. The engine, and the pusher propellers operated by it, are in a superstructure above the wings. Well to the right and to the left, under the wings, are floats to insure safe landings on water. A retractable wheel in the tail assists the forward landing gear when alighting on an ordinary airstrip.

Science News Letter, September 27, 1947



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Do You Know?

Farm ponds, built for stock water supply, irrigation, flood control, or ice, can produce fish if certain conditions are met.

ANTU, particularly effective in killing American rats of the common Norway type, causes their death from drowning in their own body fluids which accumulate in the pleural cavities around the lungs, it is claimed.

The American turkey crop this year is expected to be 15% to 20% less than in 1946.

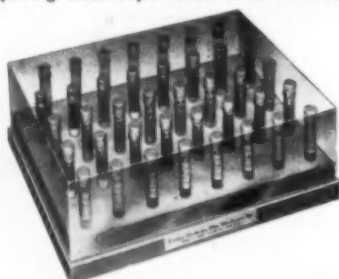
An American helicopter, especially fitted for distributing insecticides, recently spread eight tons of DDT dust over the entire surface of Visingsö island, Sweden, in two days.

Maine alone contributed 17% of last year's total American potato crop.

In applying paint with a spray gun the air pressure used must be watched; excessive pressure will cause the paint to fog.

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BIOCHEMISTRY

Oxygen Related to Cancer

Slowing down of oxidation process believed connected with cancer growth. Enzyme which promotes oxidation lacking in cancer tissue.

► CANCERS in the body may be like half-stifled slums in a city, where people sicken and go wrong for lack of enough clean air to breathe, for inability to utilize properly the food they get.

This Dickensian picture is conjured up by a technical paper on the enzyme chemistry of cancer, presented before the meeting of the American Chemical Society in New York by Dr. Van R. Potter of the University of Wisconsin, recipient of the Paul Lewis Award in enzyme chemistry.

The anarchic, mob-like piling up of cells that has long been recognized as perhaps the outstanding feature of cancer growth seems to be tied up with a slowing-down of the oxidative process that in normal cells burns up, as work or

other form of energy expenditure, possible growth-materials brought to them by the blood. Stated otherwise, as long as cells have free use of oxygen, including a normal supply of the enzymes or body-catalysts that promote oxidation, they burn up food supplies and remain normal. When absence of the necessary enzymes slows down the vital fires, the unburned food materials are accumulated and abnormal growth takes place.

Dr. Potter announced, among other new results of research in his laboratory, discovery of the absence or deficiency, in cancerous tissue, of an enzyme that in normal tissue promotes the burning up of oxalacetic acid, which might be called one of the half-consumed cinders of the body's fires.

Science News Letter, September 27, 1947

MEDICINE

Rocking Bed Used for Polio

Intended for patients whose breathing muscles are paralyzed, may replace iron lung in many cases. Aids circulation of blood.

► A NEW kind of bed may take the place of the iron lung for treatment of many infantile paralysis patients in the future. It was briefly mentioned by Miss Lucille Daniels, director of physical therapy at Stanford University, at the polio conference held in Warm Springs to commemorate the twentieth anniversary of the Georgia Warm Springs Foundation. Dr. Jessie Wright of Stanford will report on it in more detail later.

The bed is a rocking bed. By means of cranks, sections of the bed may be raised under the patient's knees and back to give a comfortable formfit. But the bed itself automatically rocks up and down, from head to foot. The speed can be regulated according to the doctor's prescription.

The bed is intended for polio patients whose breathing muscles are paralyzed.

Iron lungs keep them breathing by forcing air in and out of their lungs

by pressure. The rocking bed does this by gravity. As the head is rocked down, the weight of the internal organs presses the diaphragm up to force air out of the lungs. As the bed rocks to the foot, gravity swings the organs and diaphragm back in the opposite direction and air is sucked into the lungs.

Besides helping the patient breathe, the rocking bed helps keep his blood circulating. This is important for nourishing the paralyzed muscles. The rocking also helps eliminate body wastes and prevents calcium salts from being deposited in the bladder.

Hot packs, baths and food can be given while the bed rocks. This gives it an advantage over the iron lung. Physical therapy treatments to stretch and exercise weakened muscles can also be given while the bed rocks. These important treatments are very much limited, except for small children, when the patient is in an iron lung.

Diagnosis of infantile paralysis, like that of diabetes, may be aided by a sugar test. The test is not a sure test for polio as it is for diabetes, but it helps to distinguish polio from tuberculous meningitis and certain fungus infections which in the first few days may closely resemble polio.

The sugar test for polio is made on the spinal fluid. The quantity of sugar in this fluid may give the first lead to distinguish polio from other ailments with similar early symptoms, Dr. W. McD. Hammon of the University of California reported.

Science News Letter, September 27, 1947

MEDICINE

Will Try Cancer Serum

Three patients in U. S. will be treated with extract like that made in Russia and called KR serum. Is in experimental stage.

► THREE cancer patients in the United States will be treated about the end of October with an American-made anti-cancer extract like that made in Russia and popularly known as the KR anti-cancer serum. This was announced at the International Cancer Congress.

The material for treatment was made from germs of deadly South American Chagas' disease according to the Russian prescription by Dr. William M. Malisoff of New York. Dr. Malisoff is a Ph.D., and the treatment will be given by physicians. Qualified scientists and physicians representing the American Cancer Society and other agencies have been invited to observe the work.

The patients to be treated have already been selected. The supply of KR extract is so small and present production so slight that "there is no likelihood of our working on other cases for a long time to come," Dr. Malisoff declared.

The treatment is experimental and it is possible that it will turn out absolutely worthless to humans.

In Moscow, 10 patients have been successfully treated with the original material made by Drs. Gregory Roskin and Nina Klyueva, his wife. But no cures are yet claimed by these scientists. The longest time any of these patients has gone without relapse or recurrence of cancer is two and one-half years. Five years freedom from cancer is the accepted standard for a "cure."

Mice have been treated successfully with the made-in-America extract, Dr. Malisoff reported. He has been making the extract since May of this year and using it on mice since June.

He said it is not true that he has treated any patient so far. He believes it impossible for any patient in the United States to have been treated with

the Russian material. This is because it does not keep and must be made fresh every day. This also is an important factor limiting production of large quantities.

Bottleneck in production and difficulty in ridding the material of poisonous substances have been encountered by Dr. Theodore Hauschka of Philadelphia, who has been working on the problem for two years. Dr. Hauschka has been using the same strain of germs as that used by the Russian scientists. Dr. Malisoff used a different strain and slightly different methods of preparing the extract. These facts may or may not explain the differences in results on mice obtained by the two scientists.

Both Drs. Hauschka and Malisoff and other cancer experts agree that further work must be done to find just what the extract will or will not do for cancer patients.

Science News Letter, September 27, 1947

METEOROLOGY

New Precipitation Cycle Charted by Scientist

► A PRECIPITATION cycle covering slightly less than a week has been discovered by Dr. C. G. Abbot, research associate at the Smithsonian Institution, Washington, D. C.

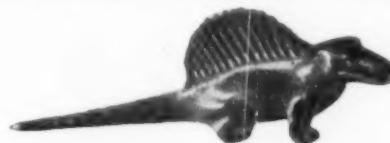
Dr. Abbot, who has previously reported a similar cycle for the radiation output of the sun, said the precipitation cycle is related in some unknown way to the solar radiation cycle of 6.6456 days.

He also reported a relationship between temperature cycles and solar radiation. Both temperature and precipitation lag behind the changes in solar radiation at the same times, Dr. Abbot found.

Science News Letter, September 27, 1947

PREHISTORIC ANIMALS

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BOTANY

NATURE RAMBLINGS

by Frank Thone



Friendly Natives

► VIKINGS, sailing along the New England coast one pleasant autumn about a thousand years ago, made a landing and found quantities of good wild grapes. They named the country Vin-

land, as it is written in the saga of Leif the Lucky.

Who knows whether the Norsemen would have attempted their later colonization if there had not been this natural abundance of the means for making was-sail? Certain it is that the Pilgrims, some half-a-dozen centuries later, appreciated those wild grapes, for mention is made in the account of the first Thanksgiving feast of plenty of wine—which certainly didn't come over in the Mayflower, overloaded as that poor little ship was with ancestors and antiques.

The grapes of Vinland are with us still. They are the species called fox grape or even the skunk grape because of their musky odor; to botanists they are *Vitis labrusca*. From this northeastern wild grape are descended practically all of the present-day cultivated grapes of eastern North America; Concord and Catawba are among their earliest offspring.

Farther south, definitely belonging to Dixie, is another very tasty wild grape, the muscadine or bullace grape, with its much larger, thick-skinned berries in smaller clusters. Botanists know it as *V. rotundifolia*. Its most notable culti-

vated descendant is the famous Scupper-nong.

There are half-a-dozen more wild grape species in the northeastern quarter of this country, but they do not figure importantly in the ancestry of cultivated kinds. The first two species have won all the honors for pedigree.

America seems to be pretty much world headquarters for grapes. Of the 35 or 36 wild grape species in the world, as recognized by Bailey's *Cyclopedia of Horticulture*, 22 are American. Most of the rest are Chinese.

Oldest of cultivated grapes, however, and farthest-travelled, is the ancient Roman wine grape, *V. vinifera*. It was carried by the legions wherever they went, and when there were no more legions under the eagles, men who marched under the Cross carried it farther still. Although California has wild grapes of its own, the grape-growing and wine-making industry of that state was founded by the *padres* on this immigrant species, whose original home is believed to have been Syria. But it is the only intruder that has been able to make headway against the competition of our native American grapes.

Science News Letter, September 27, 1947

A STORY FOR DIABETICS

BANTING'S MIRACLE

The Story of the
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SEALE HARRIS, M. D.

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MEDICINE

Mothers' Deaths Prevented

Blood tests before childbirth and measurement of blood loss, with blood bank on delivery floor urged to save maternal lives.

► MOTHERS need not bleed to death when their babies are born if proper care and preventive measures are observed, declares Dr. John Totterdale Cole of New York. (*Journal, American Medical Association*, Sept. 20)

Hemorrhage is a great menace to women today, outranking all other single causes of maternal death in the United States, he says.

Dr. Cole, who is on the staffs of Cornell University Medical College and the New York Hospital, presents a plan of treatment successfully practiced by the Women's Clinic of the New York Hospital.

He recommends a preliminary typing of the patient's blood to avoid delay in case an emergency arises. He also advises measurement and checking of blood loss.

"Absurd, yet impressive is the statement that hemorrhagic shock is caused by the loss of one drop of blood, and since

the physician does not know which drop, he should save every drop he can," he declares.

He also suggests that a small obstetric blood bank on the delivery floor would be useful. Dr. Cole, in emphasizing the importance of the time factor, urges rapid transfusions to replace at least 40% of the total blood loss during the first hour following hemorrhage.

In conjunction with the transfusion, the physician recommends the administration of an alkali to combat acidosis of shock, which may be a major factor in so-called irreversible shock by featuring in heart muscle and blood vessel damage.

Since the above measures were adopted at the Woman's Clinic there have been no deaths from hemorrhage during 3,600 major and 3,900 minor operations for women's diseases, and only one death due to hemorrhage in 14,000 deliveries.

Science News Letter, September 27, 1947

Books of the Week

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DIET AND PERSONALITY—L. Jean Bogert—*Garden City Pub. Co.*, 181 p., \$2.00. Popularly written book on nutrition which suggests how to adapt food and health habits to your type of physique and temperament.

EDUCATION IN EL SALVADOR—Cameron D. Ebaugh—U. S. Office of Education, Bulletin 1947, No. 3—*Govt. Printing*, 81 p., paper, 25c. Another basic study on education which is one of a series prepared as a part of the program of cultural cooperation under the auspices of the U. S. Dept. of State.

HISTORICAL BACKGROUND OF THE PANAMA CANAL—Walter G. Ross—*W. G. Ross*, 114 p., paper \$1.00, cloth \$2.25. 1947 souvenir yearbook and directory of the Panama Canal Societies of the U. S. presenting a short history of the project.

HOME MECHANICS—William H. Johnson and Louis V. Newkirk—*Macmillan*, 302 p., illus., \$3.95. A useful book for teaching home mechanics to boys and girls, covering such subjects as electricity in the home, plumbing and heating, repairing of household articles, etc.

NEW FIELDS OF PSYCHIATRY—David M. Levy—*W. W. Norton* 171 p., \$2.75. Describing new functions of psychiatry ranging from child guidance to military government. Based on personal experiences of the author as revealed in his Salmon Lectures.

ORNITHOLOGY LABORATORY NOTEBOOK—Arthur A. Allen—*Comstock*, 5th ed., 256 p., illus., \$4.00. Text for use in recording field observations and laboratory studies on birds of North America.

PRACTICAL DESCRIPTIVE GEOMETRY—S. E. Rusinoff—*Am. Tech. Soc.*, 259 p., illus., \$3.50. Principles of descriptive geometry presented for practical use in general engineering work, drafting room or shop.

PSYCHOLOGY IN LIVING—Wendell White—*Macmillan*, rev. ed., 393 p., \$2.95. Psychological advice intended to help you get

along with people and find satisfaction for your basic needs.

A SIMPLE MICROMANOMETER—Jeanne E. Brow and F. A. Schwertz—4 p., illus., paper. Free from: *Mellon Institute*, Univ. of Pittsburgh, Pittsburgh, Pa. Device for measuring very small pressure differences.

SUBJECT GUIDE TO U. S. GOVERNMENT PUBLICATIONS—Herbert S. Hirshberg and Carl H. Melinat—*Am. Library Assn.*, 228 p., \$5.00. Books and pamphlets are listed by subjects for ready reference or informational use, covering material published during the past twenty years.

VASCULAR DISORDERS OF THE LIMBS—Thomas Lewis—*Macmillan*, 2nd ed., 118 p., \$2.25. Practical guide for students and practitioners on circulatory troubles, presenting new methods of testing and treatment.

WOOD WASTE IN THE UNITED STATES—U. S. Forest Service, Reappraisal Report #4—*Govt. Printing*, 45 p., paper, 25c. Nation-wide report analyzing waste so that better utilization may be made.

Science News Letter, September 27, 1947

ENGINEERING

Sonar System Used Synthetic Transducer

► THE BELL Telephone sonar system, one of those that got into active service during the war in detecting completely submerged German U-boats, was described to the American Institute of Electrical Engineers meeting in San Diego by A. C. Keller of Bell Laboratories, New York, where the equipment was designed. It used a synthetic material instead of quartz to convert electrical energy to underwater sound waves.

The equipment was constructed by Western Electric Company. A majority of the 996 enemy submarines sunk during World War II were detected and located by sonar, a short name for a Sound Navigation and Ranging system. In use it sends out underwater sound waves and picks up any returned by reflection from underwater obstacles. Also, it could pick up propeller and other noises from a submerged U-boat.

The sending and receiving equipment of the sonar system was placed under water in a dome low on the hull of a ship. Within it was a transducer, a crystal device which converts electrical energy into sound pressure waves. It also received returned sound waves and converted them into electrical energy to operate detection instruments on shipboard.

The transducer used in the equipment described makes use of a synthetic compound called ammonium dihydrogen phosphate. This is capable of handling high power at high efficiency, Mr. Keller stated.

For echo ranging, a short pulse of supersonic sound is transmitted into the water by the transducer as a highly directional beam. Then immediately the electrical system is transferred to a receiving condition to pick up returned signals. The time required for the pulse to travel to the submarine and return is a measure of the range.

The target range is indicated automatically by two types of visual indicators. One shows the range on a calibrated circular scale as a flash of light. The other is a cathode ray oscilloscope on which the range is indicated by the distance a spot has moved from its starting point. The oscilloscope is a part of a bearing deviation indicator. This unit greatly increased the effectiveness of sonar equipment, and indicated whether the target was to the right or left of the transducer bearing.

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A cement coating is applied by manufacturers to some nails; it gives extra holding power.

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• New Machines And Gadgets •

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❁ **NON-SPARKING** electric cable lessens danger of explosions in coal mines and other places where explosive dusts collect. It has a fine strand of copper wire embedded between the layers of insulation; this catches early leakage and conducts it to a circuit breaker which cuts off the power.

Science News Letter, September 27, 1947

❁ **COLLAPSIBLE** trailer for automobiles can carry a load of 400 pounds and when not in use is stored in the trunk of the car. It is a one-wheel affair, with rectangular aluminum frame that supports a canvas sling, the whole trailer weighing but 45 pounds.

Science News Letter, September 27, 1947

❁ **BABY BIB**, a novelty type held in place by ordinary straps, is made of rigid plastic molded to fit the body. It has a wide open trough-like receptacle at its base to catch spilled food, which can be used also to hold soup when spoon-feeding the child.

Science News Letter, September 27, 1947

❁ **CRAYON HOLDER** for the youngster who is apt to leave his coloring chalk around the floor has a mechanism that permits only one crayon to be removed at a time. A second can not be removed until the first is put back in place. It is a flat, eight-inch long, metal case.

Science News Letter, September 27, 1947



❁ **TINY "A" BATTERIES**, shown in the picture, for portable and personal radios, offer twice the listening hours of ordinary flashlight batteries, and are largely proof against swelling and leakage because surrounded by a steel jacket covering the basic zinc cell. The steel jacket keeps them from going stale in storage.

Science News Letter, September 27, 1947

❁ **CIGAR CAN**, within which 25 cigars are packed and sealed by a special vacuum process, preserves its contents with all the flavor, aroma and moisture of freshly made "smokes." The can is opened with the familiar key used to open cans of meats.

Science News Letter, September 27, 1947

❁ **ELECTRIC PLUG** for household appliances is made of a durable plastic and is easy to use. It is only necessary to bare the wires to be attached, twist the strands firmly, insert them into the plug, and turn a slot with a screwdriver or the edge of a coin.

Science News Letter, September 27, 1947

❁ **LUGGAGE CARRIER**, recently patented, permits cartage of a piece of lumber or a ladder on the side of the car. It is a triangular support with an open space at its top to hold the object, and a hooked extension that fits over the sill of the open window. Two would be needed for a ladder.

Science News Letter, September 27, 1947

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